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# Transparency regulation in the electricity industry: A governmental affair?!

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# TRANSPARENCY REGULATION IN THE ELECTRICITY INDUSTRY: A GOVERNMENTAL AFFAIR?!

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## Abstract

*The Electronic Market Hypothesis (EMH) (Malone, Yates & Benjamin 1987) holds that electronic markets will eventually evolve towards unbiased markets under the pressure of both competitive and legal forces and that this process is inevitable in case of markets for commodities. Based on an initial literature review, we criticise the EMH for its definitional impreciseness, its disregard for strategic and technological counter forces and the absence of market characteristics as contingent factors in the prediction. These critiques drive our research interest in the nature and effectiveness of the competitive and legal forces that are held to be crucial in the evolution towards unbiased markets, in particular in the light of the regulatory authorities that are often installed to institutionalize these forces. In this paper we present our ongoing research that intends to nuance the, in our opinion, overly optimistic and naïve view of the EMH by examining the Dutch electricity industry as an example of a commodity market that has recently been liberalised. Specifically, we examine the nature and effectiveness of the regulatory transparency increasing measures of the DTe (Office of Energy Regulation) from the perspective of the DTe and the comparison websites that these measures are aimed at. Preliminary results indicate that even in markets for commodities, competitive measures have to be complemented with a proactive ‘information authority’ to enforce the ‘inevitable’ evolution towards unbiased, transparent electronic markets.*

*Keywords: electronic markets hypothesis, informational transparency, regulatory measures, electricity industry.*

# 1 INTRODUCTION

Malone, Yates and Benjamin's (1987) classic exposé on the emergence and evolution of electronic markets discerns a gradual three-staged progress of electronic markets (biased-unbiased-personalized). Based on coordination theory (Malone 1987), they argue an overall shift towards proportionately more market-based coordination. This prediction, come to known as the electronic markets hypothesis (EMH), has proven to be extremely valuable as a guiding principle in (economic) research concerning electronic markets, e-business and (dis)intermediation (see Urbaczewski, Jessup & Wheeler (2002) and Kauffman & Walden (2001) for overviews). Nevertheless, the EMH in its original publication is far from sanctifying: it is slightly optimistic, if not naïve, little nuanced. Surprisingly, the EMH has evoked relatively little theoretical follow-up and conclusive empirical evidence for it fails to be discovered (e.g. Hess & Kemerer 1994). While some researchers (e.g. Bakos 1998, Granados, Gupta & Kauffman 2006a) have added to the explanatory/predictive strength of the EMH, the predominant theoretical perspective is transaction cost economics (TCE). This has led to clarifications of issues such as consumer lock-in and switching costs, barriers to entry and reduced power for suppliers and the overall effect on price levels (e.g. Bakos 1997, Steinfield, Chan & Kraut 2000, Wigand & Benjamin 1995). However, the presumed forces that drive the transition from *biased* to *unbiased* markets, in particular the forces that relate to the required informational transparency of unbiased markets have been neither satisfactorily elaborated in theory, nor been subject to empirical testing. We aim to further the current understanding of the evolution of electronic markets by focusing on this issue in particular.

The EMH holds that in the transition from biased to unbiased markets: “producers who start out by providing an electronic hierarchy or a biased electronic market will eventually be driven by *competitive* or *legal forces* to remove or significantly reduce the bias” (Malone et al. 1987, p.492, *emphasis added*). Even though these forces are often clearly exemplified, their theoretical nature is yet to be fully understood, specifically when it comes to the forces that are held to increase the informational transparency of electronic markets. In addition, their implementation and subsequent effects are not unequivocal. In general, it is believed that if competition is stimulated, increased transparency will follow by itself. A more profound understanding of these forces will not only increase our understanding of the EMH, it is also a prerequisite for regulatory authorities to effectively design and implement measures to enhance the transparency of electronic markets in their objective to establish unbiased, or ‘frictionless’ markets in an industry. In this paper, we tentatively pose that a proactive ‘information authority’ that regulates and controls an industry’s transparency level is required for the evolution towards unbiased markets to occur. Our research question is twofold: (1) what is the nature of the competitive and legal forces that are aimed at increasing a market’s transparency? (2) To what extent are regulatory authorities effective in instituting such transparency-increasing measures? The research will addresses these questions by means of a literature review and an exploratory case study in the Dutch electricity industry.

In this paper, we first provide the results of our initial review of the literature in the form of three critiques of the EMH. We then present our approach to the empirical study in the Dutch electricity industry. We conclude by discussing some preliminary results of the research.

## 2 A CRITIQUE OF THE ELECTRONIC MARKET HYPOTHESIS

Given the tremendous impact and daringness of the EMH, criticizing it resembles committing sacrilege. As a precaution, we therefore re-emphasize our intention to further develop and nuance it. Nevertheless, based on our initial review of the literature, we criticize the EMH for 1) its lack of definitional preciseness for the concept of unbiased market, 2) its disregard for technological and strategic inhibitors in specifying the transitional forces from biased to unbiased markets, and 3) the absence of specific market characteristics as contingent factors in the predicted evolution to unbiased markets.

### 2.1 Definitional impreciseness

In the two core contributions (1987, 1989) that have put the EMH on the map, the staged evolution of electronic markets has been predicted with mediocre preciseness in its definitions. To begin with, the evolutionary market stages are ill defined in the sense that characteristics of the three stages are not discussed but merely given a general feel for by providing classical examples (typically the Baxter or Sabre case). More specifically, the concept of unbiased market is unclear. The few publications that do elaborate on this definition (e.g. Steinfeld 2000, on frictionless markets) do so by drawing solely on TCE. As a result, it remains unclear to what extent informational transparency is in fact a necessary condition for the existence of unbiased markets, and which other conditions also apply. In general, the extent to which Malone et al. appeal to economic theory on the ‘perfect’, or economically efficient, market is uncertain. The partial overlap in theoretical conditions of unbiased markets and economically efficient markets seems obvious: the perfect information assumption<sup>1</sup> should apply in order for transparent, informationally efficient, unbiased markets to exist. However, Malone et al. do not refer explicitly to efficient market theory, nor do they link its theoretical assumptions to their characterization of the three market stages. A similar critique of impreciseness applies to the transitional forces that Malone et al. describe. The staged evolution of electronic markets does not occur autonomously: transitional forces, such as *competitive* and *legal* forces (1987, p.492) will drive the change from biased to unbiased markets. The nature of the competitive forces is partly explained: buyers will benefit so significantly from the electronic brokerage effect that they will drive suppliers to remove their bias. While this force relies heavily on the market power of buyers, it nevertheless reveals part of the nature of the *competitive* forces; something, which cannot be said of the *legal* forces that are believed to be of importance. Again, these legal forces are merely exemplified (with the classic American Airlines example), not theoretically underpinned.

We believe this definitional impreciseness to be one of the reasons that “in the 10 years that have passed since the publication of the Malone et al. (1987) article, there have been few attempts to test the hypotheses” (Daniel & Klimis 1999, p.321). Moreover, the attempts that have been undertaken show very little evidence for the evolution to unbiased markets to occur: Steinfeld (2000) concludes that “it is not altogether clear that electronic markets are indeed frictionless”, while Daniel et al. (1999) find no evidence of unbiased markets in the retail financial services and the music industry, and Hess et al. (1994) conclude from their case studies that “at least five major economic agents have offered CLO’s<sup>2</sup>, yet none exists today as a pure electronic market as suggested by the hypothesis”. We suggest the theoretical conditions of unbiased markets and the two transitional forces should be clarified, in

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<sup>1</sup> The perfect information assumption holds when all economic actors instantly have complete and perfect information about all relevant aspects of market transactions and production, exchange and distribution activities, including market opportunities, available technology, cost of production under alternative productive arrangements, the quality of the goods produced and, critically, the intentions of their fellow actors; and any new information is instantly disseminated to all market parties at no cost (Truijens & Huizing 2005, p.7).

<sup>2</sup> Computerized Loan Origination systems

particular with respect to the aspect of informational transparency in order to raise the theoretical status of the EMH and to ease the empirical identification of different market stages in practice.

## **2.2 Disregarding inhibitors**

Our second critique relates to the nature of the transitional forces. We believe that Malone et al. overemphasize the positive forces that lead to unbiased markets. They disregard (or underestimate) at least two counter forces that hamper removing the biases from electronic markets: technological inhibitors and vested strategic interests of market parties around information asymmetries. First, while IT is undeniably becoming increasingly pervasive in most industries, some industries are lagging in the dissemination of information systems over *all* market parties, particularly industries with large numbers of smaller suppliers, where profit margins are thin and IT investments are prohibitive for some individual market parties (as for example in the Dutch travel industry (Truijens 2004, p.264). Alternatively, the existing IT infrastructure itself might have a lagging effect on the evolution to unbiased markets (as for instance in the airline industry). Legacy systems might be unsuited for real-time concurrent access that comparison websites require and costly (third-party) solutions (e.g. Orbitz) need to be developed first (Granados, Gupta & Kauffman 2006b, p.12). Second, the strategic imperatives of information asymmetries play an important role as a counter force in the evolution towards unbiased markets (Grover & Ramanlal 1999, Zhu 2002). As long as opaque market mechanisms exist (e.g. bidding) and information advantages are a source of economic rents in opaque markets (Truijens 2004), suppliers will have a strong incentive to deter unbiased markets. Their options range from actively boycotting unbiased market initiatives by not taking part in them or not providing information that is crucial for such initiatives to become a success (e.g. net prices, in-stock information), to initiating their own biased market initiatives placing themselves in a position to manipulate or confuse the outcomes of comparisons or to ask user fees (Bakos 1991, p.302). In addition, theoretical explanations, such as Clemons' (2003) 'move to the middle' hypothesis and six counter-myths of information and markets (Grover et al. 1999), seek to explain the economic rationale behind suppliers' efforts to hamper the removal of biases from electronic markets (see also Granados, Gupta & Kauffman (2005b, p.4-5) for an overview of 'quasi market theories'). We advocate that the EMH needs to take these strategic and technological counter forces into account in order to nuance its overly optimistic hypothesis on the evolution of electronic markets.

## **2.3 Absence of contingent factors**

Our third critique concerns the implied generality that the EMH contains: the predicted evolution to unbiased markets should apply uniformly to *all* electronic markets. Malone et al. only partly cover themselves by stating that markets evolve in different tempi. However, empirical research in the mortgage industry, retail financial services and the music industry (see 2.1) shows that especially markets for differentiated products do not evolve as anticipated, leading to the conclusion that "either the results predicted by the EMH require a longer gestation period or that the underlying hypothesis will require augmentation" (p.252). We strongly believe the latter is the case, since even over decade of patience has not led to significantly different outcomes in this industry. More specifically, we agree with the opinion (Bakos 1991, Granados, Gupta & Kauffman 2005a) that certain market properties such as its type (commodity of differentiated product) and (micro)structure<sup>3</sup> (Spulber 1999) are important contingency variables for the EMH. In markets for differentiated products, suppliers have a range of options to prevent markets from becoming transparent, for instance by engaging in extensive product differentiation, or by employing price discrimination or bundling to inhibit product and price

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<sup>3</sup> Market microstructure is defined as the set of market participants, institutions and mechanisms that enable trade. It emphasizes that firms make explicit decisions to select trading prices and coordinate transactions that support exchange (Granados et al. 2005a, p.5).

comparisons. Similarly, in markets with limited information disclosure by suppliers, a difficult price discovery by buyers and complex trading protocols, suppliers have the opportunity to deter the evolution towards unbiased transparent markets. Therefore, we emphasize that if we recognize markets to differ significantly in terms of their type and their microstructures, we should also recognize that these differences not only impact a market's transaction costs, but also on its probability to evolve towards unbiased and transparent markets. In our opinion Malone et al. have overlooked this subtlety in their hypothesis and more research is required to understand the exact influence of these two contingency variables.

Inspired by the research opportunities of our initial literature review, our intended research will focus on the nature of the *competitive* and *legal* forces that are held responsible for the evolution towards unbiased markets in commodity markets. It is stated that under the pressure of these forces in commodity markets, electronic markets will *inevitably* destabilize profitable monopolistic outcomes, thereby reducing seller profits and increasing buyer welfare (Bakos 1991). However, "the writings on the effect of information technology on market structure have largely ignored the role of government regulation" (Hess et al. 1994, p.271). In order to institute these forces in practice, regulatory authorities can be appointed that design and implement a set of measures to increase a market's level of competition and transparency. In general, it is believed that increased competition will lead to a higher level of informational transparency in a market, while Møllgaard and Overgaard (2001) show the opposite can also be the case in their study of the Danish concrete industry. Competition-enhancing measures (e.g. privatisation, liberalization of market access) have been extensively discussed and evaluated in the Industrial Organization Economics literature and tested in policies in practice. However, the nature and rationale of regulatory measures aimed directly at enhancing a market's transparency are less clear. How can such measures effectively deal with the counter forces that deter unbiased markets? Should regulatory authorities employ these transparency measures, or will 'invisible' market forces autonomously drive the market towards unbiased? Our aim in this research is to clarify the nature and effectiveness of regulatory transparency-increasing measures in commodity markets by means of an exploratory case study in the Dutch electricity industry.

### **3 RESEARCH APPROACH AND STATUS**

In order to grasp the above research opportunity, we will first extend our initial literature review to re-examine the ostensible gap in the literature from the original Malone et al. article and the subsequent work that elaborates the EMH. Furthermore, a literature review will be aimed at policy literature around deregulation and transparency, in particular with a focus on the electricity industry. The literature review will be complemented by an exploratory case study in the Dutch electricity industry. In 1998 (installation of the Electricity law), the decontrolling of the electricity industry was initiated under the auspices of regulatory authority DTe (Office of Energy Regulation) and various measures were, and are still being, installed to increase the level of competition and transparency. Some of these measures have been aimed at the electricity comparison websites. In the case study, we analyse the nature of and rationale behind the transparency increasing measures, and their effects from the perspective of the DTe and the comparison websites that currently exist.

Our choice for a qualitative approach to this study is led by the nature of the research questions posed and the observed weaknesses in theoretical grounding in the EMH. We find the case study research strategy appropriate for studying transparency regulation in the electricity industry for we attempt to illuminate a set of decisions: why they were taken, how they were implemented and with what result (Schramm 1971) and the main research question is a 'how' question (Yin 1994). Furthermore, case studies can be effectively employed for building theory (Eisenhardt 1989) that explains the nature and

effect of the competitive and legal forces in the evolution towards unbiased markets, including the possible counter forces.

The rationale behind selecting the Dutch electricity sector as the focal industry in this research is twofold. The first and foremost reason for this industry is that electricity is often mentioned as an exemplar of a commodity product for it satisfies the key characteristics of being an undifferentiated product with uniform quality, produced in large quantities by many different producers resulting in an equivalent product. In the EMH, the evolution towards unbiased markets is held to be *inevitable* in markets for commodity products. Therefore, should Malone's et al. prediction in fact be correct, it would be noticeable *in prima facie* in markets for commodities. Since the start of the deregulation in 1998 and the enforcement of free choice of electricity supplier for consumers in July 2004, several web-based initiatives that compare the products and prices of Dutch electricity suppliers have indeed emerged. Their appearance and intention to increase the market's transparency for consumers indicates that the market indeed has had biases. Now, after over a year of gestation period, we believe it is reasonable to expect that the transparency-increasing influence of these comparison websites should have a noticeable effect of removing at least some biases from the market. If not, we have reason to doubt and thus enhance the core logic underlying the predicted evolution towards unbiased market. The second reason is that the Dutch electricity industry provides a unique opportunity for investigating all parties involved, because we can benefit from the ease of surveyability of the industry. An investigation commanded by the DTe (2004) revealed that the 13 URL's of comparison websites relied on just 5 data and calculation engines. Meanwhile, a take-over purchase by one of the engines (gaslicht.com) and a discontinuation of another (energievergelijken.nl) have brought down the number of comparison engines to 3. This allows us to be complete in our case selection on the side of the comparison engines and to include gaslicht.com, energieplaza.nl and energieprijzen.nl.

The design of the case study can be characterized in spirit of Yin (1994) and Stake (2000) as a collective, exploratory, idiographic, multiple holistic case study consisting of 4 cases. The primary data source in the study is interviews held with managing directors/project managers at the case sites. By now, the managing directors of all three comparison engines have committed themselves to cooperating fully in the research and in-depth interviews with two of them have already been conducted. In addition, we have been able to collect background information from the initiator of the discontinued comparison engine in order to enlighten the main reason behind his decision to quit. On the side of the regulatory authority DTe, the initial contact has been made with the project manager that is responsible for the quality assessments of electricity comparison websites, however interviews at the DTe have yet to be conducted. In the near future, we hope to extend the scope of the research to include the three largest energy suppliers, as possible additional counter forces in the evolution towards unbiased markets.

The focus and topics of the semi-structured interviews is derived from the EMH framework depicted in figure 1. After the EMH is shortly introduced to the interviewee they are asked to reflect on and exemplify the stages that the EMH discerns as well as the reality of the evolution towards unbiased markets and the driving forces from their individual perspective. The interview then focuses on the regulatory measures that are currently implemented and their effect within the interplay of forces. Interviews are recorded, transcribed and sent to the interviewee for review and corrections before the data analysis phase. Any available documentation, research reports, news articles, company information from brochures and websites are collected to complement the interview data. All data will then be coded using Atlas.ti as a tool for qualitative data analysis in order to facilitate cross-case analysis in the final research report.

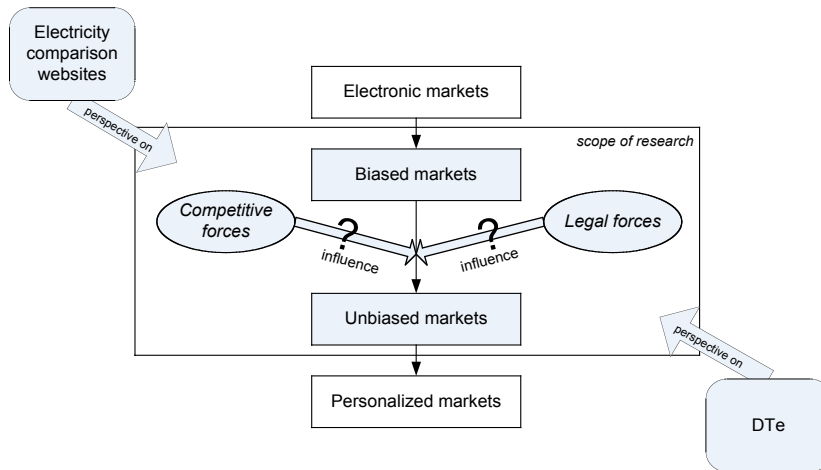


Figure 1. Scope of research and focus of interviews

## 4 PRELIMINARY RESULTS

The preliminary results in this study indicate that the market for electricity is in fact biased and the competitive and legal forces that should aid the removal of these biases are existent, respectively in the form of electricity comparison websites and the regulatory authority DTe. However, their expected influence in prospering the evolution towards unbiased markets is questionable, while, given the EMH, it should be unmistakeable given the fact that electricity is an economic commodity with low product complexity and low asset specificity.

The comparison websites that currently exist are unable to make the market fully transparent and thus unbiased. Partly, this is caused by the complexity of the tariff structure of energy products (i.e. numerous levy's, surcharges and taxes for fixed and variable parts of the tariff), partly because some suppliers, typically the three largest suppliers Nuon, Eneco and Essent, are hesitant to disclose their tariff information and/or pass on changes instantly to the comparison websites. Also, some energy suppliers make special offers for products that are only valid if bought via a particular comparison website, thus influencing (read: biasing) the outcome of the comparison in their favour. A possible explanation for these biases still to exist is that the earnings model of comparison websites is based completely on energy suppliers, either by a monthly fee or a fee per switch-over, and additional earnings from ads on the website. The supplier-based source of these earnings could make it difficult for comparison websites to pressure suppliers to remove their biases, and to disclose their correct tariff information on time, even when claiming that their ultimate objective is to provide a correct overview and comparison of all tariffs.

Whether the DTe is in fact in a position to remove these biases has yet to be investigated in more depth. However at first sight, the DTe seems to be limited in its ability to legally enforce increased market transparency and to remove existing market biases. Currently, the focus of their attention and regulatory measures are aimed at improving the quality of existing comparison websites. After an initial inspection of the quality of their information and calculations and the completeness and independency of comparisons, the DTe now intends to repeat these inspections up to 4 times a year. They, however, lack the legal measures to impose fines or enforce the compliance of comparison websites in case of any inadequacies. At the moment, the DTe has no intention to initiate their own, truly independent, comparison website, nor are they willing to sponsor or promote the comparison



website that is considered the best in their inspection. Not surprisingly, the comparison websites are benevolent towards the DTe, for their inspection provides free advice on where and how to improve their comparisons. Nevertheless, they feel that the DTe is barking up the wrong tree and should address the transparency-inhibiting practices of electricity suppliers (specifically the three largest suppliers) as well as address the complexity of the tariff structure.

Overall, it seems that to rely only on competitive forces to increase market transparency and to create an unbiased market in this industry is mainly a test of faith and patience. Strategic inhibitors to unbiased markets are a counter force, which can not be assumed to simply vanish in the evolution of electronic markets. The assumptions that IT networks will benefit buyers for instance through increased product customisation, increased outsourcing, reduced supplier dependency, multiple linked markets, expanded customer bases, and low-price guarantees in fact seem to be myths of the effective market (Grover et al. 1999). Particularly, when the legal forces are not in place, or insufficiently equipped to enforce truly fair competition and fully open information disclosure. Even when it concerns commodity markets, the EMH seems to be overly optimistic about the power of competitive forces and the effectiveness of regulatory transparency increasing measures. In our opinion, the EMH's prediction that unbiased markets will occur can only be proven to hold for markets with commodity products if a proactive 'information authority' functions in addition to the normal regulatory measures (e.g. anti-trust, anti-monopoly). If not, market parties that have no interest in increased market transparency will easily find ways to de-commoditize the market, for instance through extensive product differentiation or price discrimination. We advocate to include these and other nuances in the EMH in order to raise its explanatory power.

Finally, we stress again that we do not intend to prove that the EMH is fundamentally flawed. On the contrary we praise Malone's prediction for its provocative nature, given the time that it was made in. We hope that the nuances that this research aims to add to the EMH will enhance our thinking about the economic effects that we can realistically expect to occur in the evolution of electronic markets.

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